# NewsRelease

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# "Raining" Electrons Contribute to Ozone Destruction

First-time evidence shows electrons precipitating or "raining" from Earth's magnetosphere are destroying ozone in the upper atmosphere.

Scientists involved in the study of Solar-Atmospheric Coupling by Electrons (SOLACE) will report on this finding at the Fall American Geophysical Union (AGU) meeting in San Francisco, December 15-19, 2000. They have determined that this coupling can create a significant amount of nitrogen oxides highlighting a new aspect of natural ozone destruction.

Billions of electrons spiral back and forth between Earth's poles in the magnetosphere. The magnetosphere is an invisible region around Earth where its magnetic field controls the motions of charged particles (including electrons) in space. Even though the magnetosphere protects Earth from solar processes, the field itself can be disturbed. Fluctuations in solar wind, for example, can interfere with the magnetosphere and cause electrons to descend into the atmosphere.

"It's important that we know what events affect ozone in the stratosphere, and until now this effect on ozone hasn't been considered important," said Linwood Callis, lead research scientist for this work at NASA Langley Research Center, Hampton, Va.

Current models used to study ozone variations and climate change have not taken this solar-atmospheric coupling into account. Scientists determined that the degree of electron precipitation is directly related to the 11-year solar cycle. By excluding this cycle in models, interpretation of observed ozone changes could be misleading. Data models including electron precipitation are much more accurate than models that exclude the effects of electrons.

Callis will present the findings of SOLACE at the AGU meeting in San Francisco, Monday, December 18, at 11:48 (Moscone Center 130, Session A11C).

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